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pling embarrassment often rears its head. If employers, then, desire the maximum of benefit from their business, among other things their knowledge of their workshops should be intimate and their interest in the laborers in them active. To the advocacy of this, much of Mr. Smith's book is devoted. But the author also finds ample opportunity for scathing condemnation of unworthy foremen, who connive at dishonest practices, and, by showing they have no self-respect, set the example of impropriety to those whom they are intrusted with the care and guidance of. The capable foreman and his qualities are, of course, likewise considered. He should be honest, honorable, respecting and respected, with his conscience ever for his guide, and intelligent enough to exercise his brains when difficulties present. Of course there are very few such; but only such are fitted for the position; and an employer who lacks the foresight enabling him to detect such qualities is minus a power he can ill spare.

Note on "Blowing Off" Steam Boilers.

IN a French essay on the care of steam boilers, we find a note on the advantage of cooling off the arch after stopping and before "blowing off." It is as follows: Those who possess externally-fired boilers working only by day have all observed that the fire being covered at night, and the doors closed, the pressure rises during the night, often sufficiently to open the valves. This shows that the masonry, being at a much higher temperature than the boiler which it envelopes, imparts to it some of its heat. The same effect of heating the boilers by the masonry is produced to a less degree, it is true, but, nevertheless, to some extent, on the outer jacket of internally-fired boilers. It is consequently injurious to empty boilers soon after having stopped them, because after emptying, the plates would be heated by the action of the masonry. It is well to admit a current of air through the flue some hours after the stoppage of the generator, and not to empty it before the flues have become cooled to a temperature below 150°. When the flues are not too hot, no serious inconvenience is experienced in emptying the boiler under pressure. We do not say at high pressure, as for a boiler the pressure of which would be 5 kilogs., the temperature of the water being 152°, a great quantity of steam would be generated during the process of emptying; we think that at a pressure at one kilog. the boiler could very well be emptied. In internally-fired boilers, as there is no masonry to cool in the furnace tubes, it would be preferable to admit the current of air intended to cool the masonry behind the boiler, as in this case the furnaces would not be cooled

more rapidly than the jacket. We have sometimes seen owners empty their boilers almost immediately after the fires have been extinguished, clean them with cold water as soon as they were empty, and keep up a current of water so that the workmen might work there. Boilers of small dimensions sometimes resist this treatment, but in large boilers it will be seen that unequal contractions must take place which burst the rivets.

An Auger which Bores Square Holes.

To send a verdant youngster in search of a drill wherewith to make a square hole, is one of those time-honored workshop jokes, the freshness and originality of which is perennial with succeeding generations of perpetrators. But the laugh is now over, or at least it is on the side of the victim, for, incredible as it may appear, this apparent impossibility has been accomplished, and in a way so simple and so easy that any one may prove the fact for himself. As may be supposed, the invention has excited more genuine astonishment among the mechanics gathered at the Exposition than any of the other wonders here displayed. There is a constant crowd surrounding the inventor, watching him bore hole after hole square, and puzzling over the very simplicity of the provokingly simple solution of the problem. If I had not seen the thing done, I should have refused, as many of your readers will doubtless feel similarly inclined to do, to believe in its possibility; but, fortunately, here is a case where nothing need be taken on faith. All that is required is an ordinary hand drill-stock. A stationary one with a chuck below for holding the work, the inventor, Mr. Julius Hall, of London, uses; but he says a common brace will answer—"any thing, in fact, will do that can properly hold the drill." The tool itself is the usual form of three-square drill, so that it will be seen that no special apparatus at all is required. Clamp or chuck this drill in its holder, so that it "will wobble," and you have the whole secret. Instead of making a round hole, as it undoubtedly will if tightly grasped, when loosely held it produces a square one. Why it should act thus is at first, to all appearances, an impenetrable paradox; and even after the *rationale* is discovered, it scarcely seems quite clear.

Rosewood.

ROSEWOOD has always been considered an aristocratic wood. It is used for fine furniture and pianos by all civilized nations. We have no record of its first introduction into use, but it is fair to presume that it was soon after the discovery of South America,